DETAILED ACTION

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 28-30, 32, 34-36 and 63 are currently being examined.

Claim Rejections - 35 USC § 103

Claims 28-30, 32, 34-36 and 63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamanaka et al. (US 5,919,422), in view of Boire et al. (US 6,103,363).

Regarding claims 28-30, Yamanaka (Thirteenth Preferred Embodiment, Column 24, line 52 through Column 28, line 5 and Figures 17 and 18) teaches a photo-catalyzer vehicle curtain. The substrate of the curtain (181) is made from a glass-fiber woven cloth, which is coated with a continuous film (183 and 185) of titanium dioxide (a titanium oxide) photocatalyst (Column 25, lines 3-14). The photocatalyst film can be deposited on the glass fibers by vapor deposition (Column 26, lines 15-30). The photocatalyst can be vapor deposited on the substrate and then the temperature can be raised to calcine and form the photocatalyst layer (Column 26, lines 15-45). Yamanaka (Column 3, lines 9-25) further teaches the substrates on which the coating processes can be used, which include both glass fibers and glass plates. In the Fourteenth Preferred Embodiment (Column 28, lines 53-64), Yamanaka teaches that the process of applying the film to the solid substrate (as in the Fourteenth Preferred embodiment), the film thickness, and the physical properties of the photo-catalysts are identical with those of the Thirteenth Preferred Embodiment (glass fiber substrate). Thus, coating solid

glass and glass fibers are analogous arts. Yamanaka does not teach the specifics of the vapor deposition process or the crystallite size of the titanium photocatalyst. Yamanaka (Column 26, lines 15-45) does teach that the photocatalyst has an anatase-type crystalline structure and that the particles should be of sufficiently small diameter (Column 25, lines 45-52), in order to have a high photo-catalytic action. Since Yamanaka does not teach the specifics of the deposition process, one of ordinary skill in the art would be motivated to search out specifics for vapor depositing titanium oxide photocatalysts on glass substrates. As Yamanaka teaches that the methods and characteristics of the coating process for glass and glass fibers are the same, the search for this method would encompass deposition on either type of substrate. Boire (Column 1, lines 49-55) teaches coating a glass substrate with a crystalline titanium oxide photocatalyst. Boire (Column 7, lines 30-52 and Column 8, lines 5-18) teaches the process for vapor deposition to produce the coating. It would be obvious to one of ordinary skill in the art to use the deposition process of Boire, as the process for Yamanaka, in order to have additional specifics on how to vapor deposit a titanium dioxide photocatalyst on a glass substrate. As in Yamanaka, Boire (Column 8, lines 5-18) also teaches a post-deposition heating step to better control the degree of crystallization and crystalline nature of the oxide. Boire (Column 2, lines 5-30) further teaches that crystallites should have an average size of between 0.5 and 100nm, preferably 1 to 50 nm, in order to have an optimum photocatalytic effect.

Regarding claim 32, Boire (Column 7, lines 30-52) teaches that the vapor deposition can be performed with titanium tetrachloride.

Regarding claim 34, Boire (Column 2, lines 40-67) teaches that a photocatalytic coating can also comprise silicon oxide, zirconium oxide or aluminum oxide, in order to lower the refractive index of the coating, so as to lower the reflection of the substrate. It would be obvious to one of ordinary skill in the art to add another metal oxide to the titanium oxide photocatalyst of Yamanaka, to reduce the refractive index of the coating to minimize reflection from the vehicle curtain.

Regarding claim 35, Boire (Column 3, lines 15-31) teaches that a photocatalytic coating can be doped with a metal oxide, in order to amplify the photocatalytic effect. Many of the listed metals are transition metals. It would be obvious to one of ordinary skill in the art to dope the photocatalytic coating of Yamanaka with a transition metal oxide, as taught by Boire, in order to amplify the photocatalytic effect of the photocatalyst coating.

Regarding claim 36, Yamanaka (column 25, lines 17-22) teaches that the photocatalyst has a light rainbow-like color.

Regarding claim 63, Yamanaka (column 27, lines 53-60) teaches that the photo-catalyzer can clean and purify the air.

Response to Arguments

Applicant's arguments filed July 11, 2008 regarding the 35 U.S.C. 103(a) rejections over Yamanaka et al., in view of Boire et al. have been fully considered but they are not persuasive.

Applicant (Page 4) argues that Yamanaka teaches only a sol-gel or film lamination method of coating the curtain and that this would not provide a “continuous

film". However, as was stated in the October 4, 2007 Office Action, the April 11 Office Action and restated in this Action, the Thirteenth Preferred embodiment also teaches vapor deposition. As stated above, Yamanaka teaches that the glass-fiber woven cloth is coated with a continuous film of titanium dioxide photocatalyst. As such, the surfaces of the fibers in contact with the coating are coated with a continuous film of the photocatalyst. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., a continuous film on the entire circumferential surface of the fiber) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Applicant's description of continuous in the instant specification (Page 4, lines 14-16) show that the coating is not necessarily continuous on all parts of the fibers.

Applicant (middle of page 6) argues that the crystallite of Yamanaka do not inherently have a size that meets the claim limitation. The Examiner did not make an inherency argument. Applicant further argues that there is no motivation provided to combine the teachings of Yamanaka and Boire. However, as was stated in the April 11 Office Action and restated in this Action, Yamanaka does not teach the specifics of the vapor deposition and treatment process, but does teach that the methods and characteristic of the coating process for glass and glass fibers are the same. Thus, one of ordinary skill in the art would be motivated to search out the specifics for vapor depositing and treating a titanium oxide film on a glass substrate.

Applicant argues that the Boire reference is not analogous to the invention. However, the Examiner has provided support for why the Boire reference is analogous art for the primary reference. Since Yamanaka teaches that the methods and characteristic of the coating process for glass and glass fibers are the same, coating processes for planar glass and glass fibers are analogous.

Applicant's arguments, see top of Page 3, filed July 11, 2008, with respect to the 35 U.S.C. 102(b) rejections over Tsukada et al. (US 2002/0081246) have been fully considered and are persuasive. The Examiner agrees that the film of photocatalyst does not consist essentially of titanium oxide. The 35 U.S.C. 102(b) rejections over Tsukada et al. of claims 28-30, 34 and 63 has been withdrawn.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elizabeth Robinson whose telephone number is (571)272-7129. The examiner can normally be reached on Monday- Friday 8 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on 571-272-1284. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ear
/E. R./
Examiner, Art Unit 1794

/Carol Chaney/
Supervisory Patent Examiner, Art Unit 1794